

Medical Schools of the West

The University of Colorado School of Medicine

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On May 5, 1883, the Board of Regents of the University of Colorado directed the first president of the university, Joseph Addison Sewell, MD, to establish a medical school in Boulder. The primary reason for this action was to increase the enrollment of the university. Four months later, on September 5, the school was opened with a faculty of four members, two students and a two-year curriculum. The budget of the school at that time was \$2,600 or about 10% of the appropriation from the General Assembly of Colorado to run the university. In 1892 the curriculum was expanded to four years.

In 1909 Abraham Flexner visited Colorado and reviewed the schools of medicine in the state. In the ensuing monumental report, he urged the university to amalgamate its medical education effort with the private medical school in Denver (itself a combination of two earlier schools, Denver and Gross). This was made possible by a 1910 amendment to the Colorado State Constitution, which allowed moving the clinical years to Denver and also made it possible for the union to occur. In 1924 a 17-acre campus was established in South Denver on which were constructed a medical school, a nursing school, the Colorado General Hospital and the Colorado Psychopathic Hospital. This campus "out in the prairie" has served as the home for the University of Colorado School of Medicine since that date.

In its first 100 years, the University of Colorado School of Medicine (UCSM) has had 19 deans including Maurice H. Rees, who served for 20 years (1925 to 1945). Today, the school is one of the five major units on the Health Sciences Center campus (Figure 1), which includes the School of Nursing, the School of Dentistry, Colorado General Hospital and Colorado Psychiatric Hospital. The deans of the schools and directors of the hospitals report to a chancellor, who in turn reports to a president. The president is responsible for the four campuses of the University of Colorado

system, each of which has a chancellor. The ultimate governing body is an elected nine-member Board of Regents, which was established when the Colorado constitution was adopted in 1876.

Undergraduate Medical Education

The entering class at UCSM numbers 125 and the student body size reaches 525. The attrition rate varies between 1% and 2% per class and in excess of 95% of those admitted are Colorado residents (468 of the student body in 1982). The proportion of state residents in recent years has been steadily increasing. For the fall 1982 entering class, 197 women applied; of these, 38% (51) were admitted. Of the class, 11% (13 students) are members of minority races according to the criteria established by the Board of Regents.

The undergraduate curriculum of the UCSM is traditional in format with a disciplinary orientation. Recently a number of interdisciplinary courses have been started including one in neurosciences, one concerned with an introduction to clinical medicine and one in pathophysiology. Over the past ten years, the school has also conducted an experimental anatomy course in which students could either study anatomy involving dissection of the cadaver in the traditional way or they could take the course through the sole use of prosections. Outcomes from the anatomy experiment have indicated that students learn slightly better with the nondissection approach.

Students are required to take the usual clerkships including medicine (12 weeks), pediatrics (6 weeks), psychiatry (6 weeks), surgery (12 weeks), obstetrics and gynecology (6 weeks), neurology (2 weeks) and primary care (6 weeks). A considerable amount of time is available in the fourth year for electives including study abroad and rotations in a statewide Area Health Education Program called SEARCH.

Two major problems confront undergraduate medical education at UCSM. The first involves the class size

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Figure 1.—The University of Colorado School of Medicine is one of five major units on the Health Sciences Center campus, which includes the School of Nursing, the School of Dentistry, Colorado General Hospital and Colorado Psychiatric Hospital.

and raises the question, Should the University of Colorado School of Medicine, given the apparent overproduction of physicians in the country, reduce the number of students admitted? The answer to this question has been negative primarily because Coloradoans already have significantly less access to medical education than the national average. In addition, the population of Colorado is steadily growing and is expected to reach 4 million by 1990, or 1 million more than the 1980 census.

The second problem relates to the tuition charged at UCSM. In the 1960s, the General Assembly of Colorado decided that it was not unreasonable to ask every Colorado resident who received an education in the state to pay 25% of the costs. This has resulted in an in-state tuition for entering medical students at UCSM of \$5,986 for the 1982-1983 academic year. In 1981-1982, the tuition level in Colorado was the highest among the state-supported US medical schools and in 1982-1983, UCSM ranked second. A number of states, including New Jersey, Vermont, Wisconsin and New York, how-

ever, have increased tuition over the past year and are now approaching the levels charged at the UCSM. The national average for in-state tuition at state-supported institutions for the 1982-1983 academic year was \$2,686 and the national mean was \$2,675. In contrast to resident tuition rates, all nonresidents at UCSM are required to pay \$26,337, the highest in the country.

While there will be a number of effects of high tuition rates, three seem most ominous. First, a number of persons will fail to consider medicine as a career option because of the high costs. As such, schools of medicine with inordinately high fees could very likely become schools for the very poor or the affluent. Second, some students will have to decline offers of admission because they cannot afford to attend. Third, some students will fail to complete their studies in the usual time and some may drop out permanently because of financial exigency. None of these options are congruent with the concept of equal access to medical education for all segments of our society.

Graduate Medical Education

At present the University of Colorado trains 663 house-staff officers including clinical fellows in all disciplines of medicine. The operation of this enterprise is accomplished through a single integrated graduate medical education program with a budget of about \$12.5 million. The program offerings represent the affiliated residency programs in 19 different institutions. This integration has made it possible to establish a self-insured malpractice trust for the residents as well as a medical, dental and disability program that has been functioning smoothly and effectively for the past few years. This mechanism not only reduces the premium necessary for malpractice, but provides more control of events that lead to malpractice suits.

The problems at the graduate medical education level are the following: First, how many house staff should be trained in each discipline? Second, where can the financial support be obtained to offer competitive house-staff stipends? Third, what is the purpose of house-staff training—education or service? Fourth, how should the malpractice situation—especially involving affiliated hospitals and “residents of the University of Colorado School of Medicine”—affect UCSM’s affiliation agreements?

Continuing Medical Education

Colorado has become a very popular place to visit and vacation. From UCSM’s viewpoint, an undesirable component of this fact is that many universities and organizations use the Colorado mountains for continuing education purposes. This, coupled with a growing number of private agencies in Colorado that are offering continuing medical education courses, makes the continuing medical education market very competitive. Until recently the state of Colorado required continuing medical education for physician licensure and the local demand increased the number of enrollees in UCSM-sponsored courses. However, with the recession and a possible removal of the requirement for licensure, the number of enrollees has decreased.

Specifically, during the 1981-1982 academic year, the University of Colorado School of Medicine offered 24 continuing medical education courses. The 1,997 people who attended came from 39 states and nine foreign countries. An associate dean is the responsible administrator and a faculty advisory committee is appointed each year to review courses, advise on policies and directions, look for new markets and establish general policy. The cost of operating the courses is removed from the total income and the remaining “profits” are distributed to those departments involved in the profit-making courses. About 10% of the profits are used for academic enrichment for the school at large. Hence, the distribution of these funds provides an incentive for faculty and departments to participate in the programs.

Allied Health Programs

The University of Colorado School of Medicine offers three allied health programs. These include physical

TABLE 1.—*University of Colorado School of Medicine Grants and Contracts*

| <i>Calendar Year</i> | <i>Total Million</i> | <i>Federal Million</i> | <i>Non-Federal Million</i> |
|----------------------|----------------------|------------------------|----------------------------|
| 1977 | \$25.1 | \$21.3 | \$3.8 |
| 1978 | 27.6 | 23.3 | 4.7 |
| 1979 | 32.1 | 27.5 | 4.5 |
| 1980 | 34.3 | 28.4 | 5.9 |
| 1981 | 31.3 | 22.8 | 8.5 |
| 1982 | 33.3 | 26.7 | 6.5 |

therapy (which is the only such program in the state and admits about 30 students per year), medical technology (the first such program in the United States and admits 20 students) and the Child Health Associate Program (known as CHAP and the first of its kind in the United States). The Child Health Associate Program has served as a model for nurse practitioner programs elsewhere and currently admits 44 students per year.

In addition to the allied health programs, the medical school faculty participate in a variety of master’s and PhD degree graduate programs. These are administered by a graduate school coordinator on the Health Sciences Center campus who in turn reports to the president of the university. Master’s degrees are offered in six disciplines and PhD degrees in nine disciplines. In addition to formal graduate education, the school offers a variety of one- to three-year postdoctoral training programs that attract persons from all over the world.

Research

In general, biomedical research has played a prominent role in the overall growth and development of the University of Colorado School of Medicine. Total grants and contracts have grown from \$25.1 million to \$34 million per year during the past five years (Table 1). Of this, federal sources have grown from \$21.3 to \$24.4 million and nonfederal sources have grown from \$3.8 to \$8.5 million. At present 38.6% of faculty salaries depend on grants and contracts and, hence, this activity has become an integral part of the School of Medicine.

Cancer biology, neurosciences, immunology, cell biology and developmental and molecular biology are areas of special emphasis today. Among the major contributions of the past has been the Denver Child Development Scale, which is used around the world. In addition, the Denver Classification of Human Chromosomes is widely accepted and the pioneering application of ultrasound scanning to diagnostic medicine first occurred in Colorado. The child abuse syndrome was defined in Denver, the world’s first liver transplant was carried out at the School of Medicine and the world’s first perinatal medicine division was also established at the University of Colorado.

A number of challenges face the research activities of the school. These include the evolving university-industry relationships, the uncertainty of federal grants and contracts, the difficulty in meeting space and equip-

ment needs of faculty and especially the younger faculty, the limited number of physicians choosing full-time careers in research and the difficulty of obtaining graduate student and fellowship stipends.

Patient Care

The university owns and operates a 400-bed hospital known as the University Hospital-Colorado General. This hospital, which derived from the old Colorado General Hospital, was statutorily established primarily for the care of medically indigent persons, or those who could not provide for themselves. This statutory requirement for the care of indigents has created continuous and ongoing financial distress for the institution. This distress is compounded by a history of extensive "line-iteming" and poor funding by the Colorado legislature. Beginning with the 1982 fiscal year, however, the legislature granted budget flexibility to the University of Colorado for the operation of its University Hospital. This, in essence, allowed the hospital to carry forward into the next fiscal year any unspent revenues in the form of reserves, depreciation allowances, capital purchases and the like. In addition, Robert Dickler, the hospital administrator, has initiated major changes. The hospital has never been in better fiscal condition. Morale and optimism have never been higher.

While most of the emphasis has always focused on Colorado General Hospital, the university operates a second hospital by state statute. This is the University Hospital-Colorado Psychiatric Hospital. Administratively separate with its own budget, the Colorado Psychiatric Hospital operates 35 inpatient beds and an extensive outpatient service, and represents the primary acute care hospital in the state. The Chairman of the Department of Psychiatry is by state statute the superintendent of the hospital and has responsibility for the hospital's budget and personnel. This hospital has been effectively managed over the years and consistently has had positive fiscal balances at year end.

The two hospitals, together with the major affiliated hospitals of Denver General Hospital, The Childrens Hospital, The National Jewish Hospital and Asthma Research Center, Rose Medical Center and Denver Veterans Administration Medical Center, have a total of some 1,800 beds that are used for education and research purposes. Of these, the Denver VA Medical Center is the most closely linked to the university; it is now undergoing a \$60 million renovation and expansion program.

Turning to professional fees, a state statute mandated that before July 1, 1981, all professional fees earned by the faculty of the School of Medicine had to be used solely for faculty salaries. In addition the state's legislature looked upon this Faculty Practice Fund cash as a revenue source and, therefore, felt comfortable in appropriating a portion of the cash to support education or other state activities. This resulted in a series of operating deficits in the school's Faculty Practice Fund (Table 2) and repeated financial crises. This chaotic financial situation was compounded by the statutory

TABLE 2.—Fiscal Summary of UCSM Faculty Practice Fund

| FY | Patient Cash Million | Excess (Deficit) Million | Debt Million |
|--------------|----------------------|--------------------------|--------------|
| 1975-1976 .. | \$ 4.95 | (\$0.8) | (\$1.36) |
| 1976-1977 .. | 6.30 | (1.04) | (2.40) |
| 1977-1978 .. | 6.7 | (0.45) | (2.86) |
| 1978-1979 .. | 6.9 | (1.44) | (4.30) |
| 1979-1980 .. | 8.4 | 1.06 | (4.20) |
| 1980-1981 .. | 9.5 | 1.09 | (4.10) |
| 1981-1982 .. | 12.7 | 2.90 | (3.70) |
| 1982-1983 .. | 15.3 | 3.70 | (3.05) |

TABLE 3.—UCSM Faculty Practice Fund—Professional Fees Related to Medically Indigent Patients

| Year | Amount | Reimbursement Million |
|----------------|-----------|-----------------------|
| 1982-1983 | \$..... | \$1.25 |
| 1981-1982 | 9,425,804 | 1.00 |
| 1980-1981 | 7,244,875 | 0.75 |
| 1979-1980 | 4,200,424 | 0.00 |
| 1978-1979 | 4,815,810 | 0.00 |
| 1977-1978 | 4,783,174 | 0.00 |
| 1976-1977 | 4,858,482 | 0.00 |
| 1975-1976 | 3,042,323 | 0.00 |
| 1974-1975 | 2,929,244 | 0.00 |
| 1973-1974 | 2,478,454 | 0.00 |
| 1972-1973 | 2,266,548 | 0.00 |
| 1971-1972 | 2,487,156 | 0.00 |

mandate to provide medically indigent care at Colorado General and Colorado Psychiatric Hospitals.

Beginning in 1979-1980, things began to change. In that year, the finances of UCSM reversed the previous pattern and the new trend has continued to the present. In 1980-1981, the legislature began to appropriate funds for the faculty's efforts in providing care for the medically indigent. This has increased slightly in each subsequent year but still represents only a small percentage of the total care provided (Table 3).

In addition, in 1981 the Colorado General Assembly unanimously approved the establishment of a nonprofit foundation outside of the University of Colorado for billing and collecting professional fees. In July 1982 this Colorado Medical Services Foundation was activated following final approval by the Board of Regents. The foundation provides an incentive, not only for the school and departments, but also for each faculty member, who can increase his or her salary by a factor of 50% by seeing patients. As a result of this program, the cash generated from the practice of medicine has doubled since 1978-1979.

In the patient care area, a number of significant problems remain. These include a heavy medically indigent responsibility with inadequate reimbursement for physician effort, the uncertainty of medicare-medicare regulations reimbursement and an oppressive state personnel and purchasing system. The latter is especially vexing for a school of medicine such as the UCSM with its multitudinous sources of revenues, each of which has special regulations.

TABLE 4.—UCSM Faculty Salary Sources, 1982-1983

| Source | Amount Million | Percentage |
|---|-------------------|--------------|
| State | \$ 9.3 | 27.6 |
| Grants and contracts | 13.0 | 38.6 |
| Colorado Medical Services Foundation .. | 11.4 | 33.8 |
| TOTAL | \$33.7 | 100.0 |

Faculty

For the 1982-1983 academic year, the University of Colorado School of Medicine had 604 full-time faculty members on the main campus. In addition, there were 229 full-time faculty members at affiliated institutions, including the VA Medical Center, The Childrens Hospital, Denver General Hospital and the National Jewish Hospital/Asthma Research Center. The efforts of the 833 full-time faculty are supplemented by 2,193 voluntary faculty. The faculty salaries are derived from three sources (Table 4) and provide some protection against variations in the salary sources.

Among the challenges in the faculty area, the most annoying is the tenure issue. If state-supported full-time equivalents are used as a tenurable base, then UCSM was significantly overtenured over the past ten years. With the establishment of Colorado Medical Services Foundation and resignations, this matter has nearly reversed itself to a balance between tenured faculty and full-time equivalents. It does not allow, however, for the tenuring of junior faculty, which is very discouraging to young academicians.

The second problem relates to salaries. At the basic science level, salaries are generally competitive in the range of the Association of American Medical Colleges' 50th percentile figures. On a clinical science level, at the lower ranks, salaries are also reasonable. At the higher clinical ranks, however, the salaries have been embarrassingly low. The 29.9% increase in salaries and bonuses that has been paid since fiscal year 1980-1981 (two years) has helped but the issue remains.

Budget

The School of Medicine's 1982-1983 budget was \$81.7 million. This was derived from state sources

(17.7%), grants and contracts (42%), patient care (19.9%) and tuition, graduate medical education, continuing medical education, gifts and bequests (20.4%).

In the past, budget inflexibility, which was mandated by the state's legislature, was compounded by the inflexible state personnel and state purchasing system. Beginning in July 1982 the Health Sciences Center campus received budget flexibility similar to that which had been obtained earlier for the University Hospital. With some minor program exceptions, including family medicine and physician reimbursement for the care of medically indigent, this flexibility has provided many new options for the financial management of UCSM. One specific outcome had been the ability to maximize the use of the limited dollars available. However, in spite of the budget flexibility, the school has had only limited state support and, in fact, has received less state funds than most state-supported medical schools in the West. This limited support has led to an increasingly greater dependency on grants and contracts, which in turn was enhanced by limited clinical income.

Future

There are many reasons to be optimistic about the future growth and development both in size and quality of the University of Colorado School of Medicine. Among them is the emergence of Denver as a business, communication, transportation and banking center. In addition, Colorado has impressive energy resources including shale oil, coal and uranium. In the past five years, Colorado has undergone a major building boom, which corresponds to an increase in the population. It is expected that the state's population will reach 4 million by 1990, 1 million more than at present, and that most of this growth will occur in Denver.

As noted, there have also been a number of changes at the legislative level, which has been very encouraging. And the potential exists for an expanded tax base in Colorado. These factors, together with the quality of the faculty, the leadership of the university, the abundant clinical resources without severe competition in the practicing community and the attractive surroundings, make the future of the University of Colorado School of Medicine most encouraging.